

L 46039-66 EWT(m)/EWP(t)/ETI TJP(c) JD

ACC NR: AT6022714

SOURCE CODE: UR/2848/66/000/041/0281/0289

AUTHORS: Chechentsev, V. N.; Firsanova, L. A.; Zaytsev, V. N.; Matviyenko, L. F.

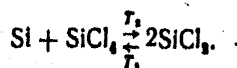
ORG: Moscow Institute for Steel and Alloys, Department for Manufacture of Pure Metals and Semiconductor Materials (Moskovskiy institut stali i splavov, Kafedra proizvodstva chistyykh metallov i poluprovodnikovyykh materialov) 38 B+

TITLE: Obtaining high purity silicon by vacuum distillation for the lower chloride

SOURCE: Moscow. Institut stali i splavov. Sbornik, no. 41, 1966. Fizicheskaya khimiya metallurgicheskikh protsessov i sistem (Physical chemistry of metallurgical processes and systems), 281-289

TOPIC TAGS: silicon, silicon compound, vacuum distillation

ABSTRACT: The kinetics and thermodynamics of the silicon purification by vacuum distillation from SiCl_2 was studied. The standard free energy calculations for a number of reactions of SiCl_4 with various elements were carried out by the method of A. N. Krestovnikov i. dr. (Spravochnik po raschetam metallurgicheskikh reaktsiy, Metallurgizdat, 1963). The results of the calculations are presented graphically (see Fig. 1). These calculations showed the feasibility of obtaining high purity silicon according to the reaction



Card 1/3

MOEACHEVSKIY, Yu.V.; SAITSEV, V.N.

Coprecipitation of calcium phosphate with gamma quantities of a
number of elements included in the composition of complex ores.
Uch. zap. LGU no.297:90-95 '60. (MIRA 13:11)
(Calcium phosphate)

MORACHEVSKIY, Yu.V.; ZAYTSEV, V.N.; FOKIN, V.V.

Separation of small amounts of gallium from aluminum by coprecipitation. Uch. zap. LGU no.297:81-84 '60. (MIRA 13:11)
(Gallium) (Aluminum)

MORACHEVSKIY, Yu.V.; ZAYTSEV, V.N.

Coprecipitation of gamma quantities of zinc and gallium with calcium
phosphate. Uch. zap. LGU no.297:77-80 '60. (MIRA 13:11)
(Zinc) (Gallium) (Calcium phosphate)

MORACHENSKIY, Yu.V.; ZAYTSEV, V.N.

Coprecipitation of small amounts of certain elements with
metal hydroxides. Report No.4: Coprecipitation of europium
with iron and aluminum hydroxides. Uch.zap.LGU no.272:
134-137 '59. (MIRA 13:1)
(Europium) (Iron hydroxide) (Aluminum hydroxide)

MORACHEVSKIY, Yu.V.; ZAYTSEV, V.N.

Coprecipitation of gallium, indium and thallium with calcium
phosphate. Trudy kom.anal.khim. 9:135-143 '58. (MIRA 11:11)
(Precipitation) (Metals, Rare and minor) (Calcium phosphate)

Action of aromatic diazo compounds on alkyl dihydrazides
 esters as a method for the synthesis of arylhydrazones of
 α -keto and of α -amino acids. VII. Synthesis of valine.
 V. V. Feofilaktov and V. N. Zaitsev. *J. Gen. Chem.*
 (U. S. S. R.) 13, 336-337 (1943) (English summary); cf.
 C. A. 37, 2347. In continuation of their previous work on
 this reaction type, the authors present a synthesis of valine.
 Propylacetoacetic ester was condensed in the usual manner
 with an equimol. amt. of PhN_2OK , extd. with Et_2O ,
 saponif. with alc. NaOH and acidified with HCl to yield
 35.4% butyrylformic acid phenylhydrazones, m. 105-6°
 (from Et_2O and ligroin). Crystn. from benzene gives a
 product m. 108°; this may be due to the presence of
 traces of the 2nd form of the hydrazone, m. 114-15°, which
 is removed by benzene. The hydrazone was reduced in
 EtOH by Zn dust and alc. HCl, treated with Ag carbonate
 and H_2S , and the filtrate was concd. to yield 77.4%
 valine, m. 304-6° (from aq. EtOH; sealed tube). Propyl-
 acetoacetic ester (4.3 g.) was added to cooled p -tolylidi-
 azotate (from 2.67 g. p -toluidine diazotized in HCl in the
 usual manner and added with cooling to 9.75 g. KOH in
 97 cc. water); the product was extd. with Et_2O , saponif. by
 alc. KOH, the EtOH distd. off and the residue extd. with
 Et_2O after addn. of water; the alk. soln. was acidified
 by HCl with cooling; butyrylformic acid p -tolylhydrazones
 was obtained in 43.4% yield, m. 118-19°; crystn. from
 benzene yields 2 forms of this: one m. 134-6°, the other
 could not be isolated in pure state, but the crude product
 m. 121-81°. Reduction of the crude hydrazone by Zn dust
 in alc. HCl, followed by the usual procedure of purifica-
 tion, gave 90.4% valine, m. 305-6° (from water; sealed

tube). VIII. Synthesis of tyrosine. V. V. Feofilaktov,
 V. N. Zaitsev and K. I. Surotkina. *Ibid.* 363-73 (1943)
 (English summary). PhOMe was converted into p -
 methoxybenzyl chloride (I) as follows: 180 g. MeOPh, 90
 g. 40% formalin, 30 cc. petr. ether and 35 g. ZnCl₂ were
 stirred with ice cooling and HCl passed into the mixt. in a
 vigorous stream for 1 hr.; the upper layer was sepd.,
 treated with ice, washed with water, dried and distd.
 to yield 30% I, b. 90-102°, n_D^{20} 1.5503. To a soln. of
 NaOEt (from 11.5 g. Na) in abs. EtOH was added 71.8

g. $\text{AcCH}_2\text{CO}_2\text{Et}$ with cooling and stirring, followed by
 78.20 g. I at room temp.; the mixt. was refluxed for 3 hrs.
 and p -methoxybenzylacetoacetic ester was isolated in 76.2%
 yield, b. 180-1°, n_D^{20} 1.5077, d_4^{20} 1.1033. Aniline-HCl
 (10.36 g.) in 64 cc. water and 8.8 cc. concd. HCl was diazo-
 tized by 6 g. NaNO_2 in water, and, after 30 min. standing in
 the cold, added to 31 g. KOH in 300 cc. H_2O with stirring
 and ice cooling, after which the above ester (20 g.) was
 added dropwise and the mixt. stirred for 4 hrs. and extd.
 with Et_2O ; after distn. of the latter the product was
 saponif. with alc. KOH, the EtOH distd. off, water added
 to 300 cc. volume, the mixt. extd. with Et_2O , cooled and
 acidified with HCl to yield 76.3% p -methoxyphenyl-
 pyruvic acid phenylhydrazones, isolated in 3 forms by crystn.
 from benzene-ligroin: m. 158-9° and 180°. Reduction by
 Zn dust in alc. HCl gave 50-5% p -methoxyphenylalanine,
 m. 232° (from water); boiling the latter with HI (b.
 126°) for 5 hrs. gave 95.6% tyrosine, m. 308-10° (from
 water).
 O. M. Kosolapoff

438-314 METALLURGICAL LITERATURE CLASSIFICATION

6-27-52/ADNFC

12000 STUDYING

12000 STUDYING

12000 STUDYING

12000 STUDYING

BURMISTROV, S.I.; ZAYTSEV, V.N.

Alkylation of nitrophenols. Part 1: Alkylation of p-nitrophenol.
Zhur. ob. khim. 34 no.9:3089-3092 S '64.

(MIRA 17:11)

1. Dnepropetrovskiy khimiko-tehnologicheskii institut.

ZAYTSEV, V.N.; MESHCHANSKIY, F.L., redaktor; VASIL'YEVA, V.I., redaktor;
KOZ'MIN, G.M., tekhnicheskii redaktor.

[Instruments for barometric leveling] Pribory dlia barometricheskego nivelirovaniia. Moskva, Izd-vo geodezicheskoi lit-ry, 1956.
86 p. (Barometer) (MLRA 9:6)

ZAYTSEV, V.M., assistant; SADYKOV, B.G., aspirant

Case of posttransfusion complications caused by Rh-incompatible blood and its effective treatment with cortisone. Kaz. med. zhur. no.4:80-81 J1-Ag '61. (MIRA 15:2)

1. Kafedra fakul'tetskoy terapii (zav. - prof. Z.I.Malkin) i 1-ya kafedra akusherstva i ginekologii (zav. - prof. P.V.Manenkov) Kazanskogo meditsinskogo instituta, na baze Respublikanskoy klinicheskoy bol'nitsy (glavnyy vrach - Sh.V.Bikchurin [deceased]).
(BLOOD TRANSFUSION) (RH FACTOR) (CORTISONE)

ZAYTSEV, V.M.

Cooling effectiveness in milling heat-resistant nickel-base
alloys. Stan. 1 instr. 34 no.11:31-33 N '63. (MIRA 16:12)

ACCESSION NR: AP4002657

required for tool failure. The failure times for four methods were respectively: 118, 81, 180, 137 minutes (116 minutes without cooling). It was found that pulverized emulsion under 2.5 kg/cm² is most effective, followed by oil mist and ordinary emulsion stream. Orig. art. has: 4 figures and 2 tables.

ASSOCIATION: none

SUBMITTED: 00

DATE ACQ: 17Dec63

ENCL: 00

SUB CODE: IE, ML

NO REF SOV: 000

OTHER: 000

Card 2/2

ACCESSION NR: AP4002657

S/0121/63/000/011/0031/0033

AUTHOR: Zaytsev, V. M.

TITLE: Effect of cooling in milling nickel-base heat-resistant alloys

SOURCE: Stanki i instrument, no. 11, 1963, 31-33

TOPIC TAGS: milling, heat resistant alloy, cutting fluid, cutting fluid composition, high speed steel tool, machining, atomized cutting fluid, high speed steel, cooling, cooling effect, nickel base alloy

ABSTRACT: The effectiveness of cooling methods during milling of alloy EI437B was investigated both in the laboratory and in industry. The laboratory milling cutter and conditions were as follows: cutter - made from steel R18, $D = 110$ mm, $z = 6$, geometry - $\delta = 10^\circ$, $\alpha = 12^\circ$, $\phi = 45^\circ$; width of cut 32-38 mm, depth 2 mm, feed 0.13 mm/tooth, speed 10 m/min. Four cooling methods were tried: 1 - stream of 7% water-oil emulsion with different additives (10-12 liter/min); 2 - high-pressure jet of 7% water-oil emulsion at 10-15 kg/cm² (0.7-0.8 liter/min); 3 - 7% water-oil emulsion pulverized with air at 2.5 kg/cm² (150-200 g/hr, air 0.9 m³/hr); 4 - oil mist at 2-2.5 kg/cm² (oil 15-20 g/hr, air 0.6-0.9 m³/hr). For comparison no cooling was attempted. The effectiveness of the cooling method was measured by the time

Card 1/2

ZAYTSEV, V.M.; MOKEYEVA, V.A.

Two-center integrals of the theory of molecules. Zhur.strukt.
khim. 4 no.5:734-738 S-0 '63. (MIRA 16:11)

1. Permskiy gosudarstvennyy universitet imeni A.M.Gor'kogo.

GOL'DSHTEYN, M.I., prof. (Kazan'); ZAYTSEV, V.M., assistant (Kazan')

Detection of congenital heart defects. Kaz.med.zhur. no.5:55-57
S-O '60. (MIRA 13:11)

(HEART--ABNORMITIES AND DERORMITIES)

APPROVED FOR RELEASE: 06/23/11: CIA-RDP86-00513R001964100018-6

ZAYTSEV, V. M., Cand Med Sci -- (diss) "Serumal proteins of the blood in various forms of atherosclerosis according to data obtained through paper electrophoresis." Kazan', 1959. 10 pp; (Kazan' State Medical Inst); 225 copies; free; (KL, 23-60, 127)

ZAYTSEV V.M.

ANISIMOV, V.Ye., kand.med.nauk; ZAYTSEV, V.M.

Changes in the cholesterol, choline, and protein fractions of blood
in atherosclerosis patients on a saltless diet. Sov.med. 21
no.11:95-98 N '57 (MIRA 11:3)

1. Iz kafedry fakul'tetskoy terapii (zav.-zasluzhennyy deyatel' nauki
Tatarskoy ASSR prof. Z.I.Malkin) Kazanskogo meditsinskogo instituta.
(ARTERIOSCLEROSIS, ther. salt-less diet, eff. on choline,
cholesterol & protein in blood)
(DIET, in various, salt-less in arteriosclerosis,
eff. on choline, cholesterol & protein in blood)
(CHOLINE, in blood, eff. of salt-less diet in arteriosclerosis)
(CHOLESTEROL, in blood, same)
(BLOOD PROTEINS, in various dia.
arteriosclerosis, eff. of salt-less diet)

ZAYTSEV, V. M.

PHASE I BOOK EXPLOITATION

SOV/5040

Reznikov, Naum Iosifovich, Igor' Grigor'yevich Zharkov, Vladimir Mikhaylovich Zaytsev, Arkadiy Semenovich Kazarin, Boris Alekseyevich Kravchenko, and Fedor Prokof'yevich Uryvskiy

Proizvoditel'naya obrabotka nerzhavayushchikh i zharoprochnykh materialov (Efficient Processing of Corrosion- and Heat-Resistant Materials) Moscow, Mashgiz, 1960. 198 p. Errata slip inserted. 7,000 copies printed.

Ed. (Title page): Naum Iosifovich Reznikov, Honored Scientist and Technologist RSFSR, Doctor of Technical Sciences, Professor; Ed. of Publishing House: A. F. Balandin; Tech. Ed.: V. D. El'kind; Managing Ed. for Literature on Metalworking and Machine-Tool Making: V. I. Mitin, Engineer.

PURPOSE: This book is intended for technical personnel and highly skilled workers in the metalworking industry.

COVERAGE: The authors discuss the general characteristics and classifications of modern corrosion-, scale-, and heat-resistant materials with

Card 1/9

ZAYTSEV, V. M., Cand Tech Sci -- (diss) "Cooling efficiency in the process of sharpening non-corrosive and fire-resistant materials." Moscow, 1960. 17 pp; (Ministry of Higher and Secondary Specialist Education RSFSR, Moscow Aviation Technology Inst); 120 copies; price not given; (KL, 50-60)², 33)

ZAYTSEV, V.M.

Effect of cooling media on the strength of cutting tools and
surface smoothness of parts. Stan.1 instr. 29 no.6:12-14 Je '58.
(MIRA 11:7)

(Metal cutting--Cooling)

ZAYTSEV, Vladimir Mikhaylovich; KOLOMIYTSOVA, O.I., redaktor; YUSFINA, N.L.,
tekhnicheskii redaktor

[Technical progress is the most important factor in the development
of the national economy of the U.S.S.R.] Tekhnicheskii progress -
vashneishee uslovie razvitiia narodnogo khoziaistva SSSR. Moskva,
Gos. izd-vo kul'turno-prosvetitel'noi lit-ry, 1956. 29 p. (MLRA 9:7)
(Technology) (Russia--Industries)

ZAYTSEV, V.M.

Calculation of one-electron three-center integrals. Zhur.
strukt. khim. 6 no. 4:654-655 J1-Ag '65 (MIRA 19:1)

1. Permskiy gosudarstvennyy universitet. Submitted February 23, 1965.

L 18108-63

ACCESSION NR: AP3006153

at 150-200 g/hr. Another experiment involved the use of "oil mist" delivered at 15-20 g/hr. The coolants were introduced from various directions. The best results in milling 1Kh18N9T and EM437B were produced by coolant delivered downward at the front edge of the tool, under a pressure of 10-15 atm. Application of emulsion called for the use of compressed air, assured clean working conditions, and extended the life of tools. The author concludes that tool life is influenced by the quality of tool material, accuracy of tool grinding, proper feed of work, and proper cutting speed. For continuous cutting he recommends the use of a stream of coolant under 10-15 atm, and for milling, the use of an atomized emulsion. Orig. art. has: 2 tables.

ASSOCIATION: none

SUBMITTED: 00

DATE ACQ: 18Sep63

ENCL: 00

SUB CODE: ML

NO REF SOV: 000

OTHER: 000

Card 2/2

L 18108-63

ACCESSION NR: AP3006153

EWI(d)/EWP(k)/EWP(q)/EWT(m)/BDS

APPTC/ASD Pr-1/Pad JP/HW
8/0122/63/000/008/0070/0072

AUTHOR: Zaytsev, V. M. (Candidate of Technical Sciences)

TITLE: Choice of a cooling method for milling and sharpening heat-resistant and corrosion-resistant materials

SOURCE: Vestnik mashinostroyeniya, no. 8, 1963, 70-72

TOPIC TAGS: coolant, milling, sharpening, heat-resistant material, corrosion-resistant material, cutting tool, atomized emulsion

ABSTRACT: Experiments have been conducted on machining heat-resistant alloys and stainless steels containing large amounts of titanium, molybdenum, cobalt and nickel (1Kh18N9T, EI654, EI437B, EI598, EI766, VT1-1, VT1-2, OT4, VT6, etc.) It was found that cutting tools best suited for this purpose should be made of hard alloys VK6M and VK8. Various methods of applying a 7% cooling emulsion were tested in machining of steel 1Kh18N9T and alloy EI437B to determine their influence on tool life and on cutting temperatures. Tool bits used on these metals carried inserts of alloy VK8. Milling cutters made of steel R18 were used in machining alloy EI437B. Cooling liquid was applied in a large stream at 10-12 liter/min, a thin stream under a pressure of 10-15 atm at 0.7-0.8 liter/min, and as atomized emulsion under 2-2.5 atm

Card 1/2

VILESOF, F.I.; ZAYTSEV, V.M.

Photoionization of the phenyl derivatives of elements of
the 5th group. Dokl. AN SSSR 154 no.4:886-889 F '64.
(MIRA 17:3)

1. Fizicheskiy institut Leningradskogo gosudarstvennogo
universiteta im. A.A. Zhdanova. Predstavleno akademikom
A.N. Tereninym.

ACCESSION NR: AP4012973

are believed to have a planar structure, the triphenyl-group 5 element compounds, a trigonal pyramidal shape. The higher stability of the pyramidal form for the heavier analogs is explained by the appearance of the p-d hybridization, since the d-electrons are more easily accessible to P and the heavy elements than in nitrogen. The data and their discussion show that the main ionization potential of the group 5 element-triphenyl derivatives is determined by the separation of one of the unshared pair of electrons of the central atom. Orig. art. has: 1 table and 4 figures.

ASSOCIATION: Fizicheskii institut Leningradskogo gosudarstvennogo universiteta im. A. A. Zhdanova (Physics Institute, Leningrad State University)

SUBMITTED: 24Jun63

DATE ACQ: 26Feb64

ENCL: 01

SUB CODE: PH

NO REF SOV: 005

OTHER: 015

Card 2/3

ACCESSION NR: AP4012073

S/0020/64/154/004/0886/0889

AUTHOR: Vilesov, F. I.; Zaytsev, V. M.

TITLE: Photoionization of phenyl derivatives of elements of the 5th group.

TOPIC TAGS: diphenylamine, triphenylamine, triphenylphosphine, triphenylarsine, triphenylstibine, triphenylbismuth, photoionization, ionization potential, group 5 element ionization

SOURCE: AN SSSR. Doklady*, v. 154, no. 4, 1964, 886-889

ABSTRACT: The photoionization of diphenylamine and triphenylamine, -phosphine, -arsine, -stibine, and -bismuth was studied in the gas phase (200-250C) in the 1500-1800 Angstrom range. The effectiveness of the ionization in the vicinity of the threshold of ion formation varies strongly within this group of elements (fig. 1). The change in ionization potential, the magnitude of the dipole moment and the ability to form some complexes decreases from P, to As, to Sb, to Bi. The ionization potential for triphenylamine is even less. The alkylamines

Card 1/3

NEFEDOV, V.D.; ZAYTSEV, V.M.; TOROPOVA, M.A.

Chemical changes taken place during the processes of β -decay.
Usp.khim. 32 no.11:1367-1396 N '63. (MIRA 17:3)

1. Leningradskiy gosudarstvennyy universitet imeni Zhdanova.

ZAYTSEV, V.M.; KOSILOV, V.F. (Saransk)

Lethal result from shock following intravenous introduction of
glucose with vitamins C and B₁. Kaz. med. zhur. no.5:24 S-0'63
(MIRA 16:12)

ZAYTSEV, V.M., kand.med.nauk

Clinical aspects of atypical infarction of the myocardium.
Kaz.med.zhur. no.1:68-69 Ja-F'61 (MIRA 16:11)

1. Kafedra fakul'tetskoy terapii (zav.-prof. Z.I. Malkin)
Kazanskogo meditsinskogo instituta i Respublikanskaya klini-
cheskaya bol'nitsa (glavvrach - Sh.V.Bikchurin).

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L 22904-66
ACC NR: AP6006868

electron-phonon interaction, written in the second-quantization representation. The equations show that interaction with the acoustic phonons leads to a temperature dependence of the effective mass which in principle can be determined from measurements of the cyclotron resonance, if the dimensionless coupling constant is not too small. The measurements are best carried out at low carrier densities. Orig. art. has: 2 formulas.

SUB CODE: 20/ SUBM DATE: 20Jul65/ ORIG REF: 004

Card 2/2 810

L 22904-66 EWT(1)/EPF(a)-2/T/ETC(m)-6 IJP(c) WW

ACC NR: AP6006868

SOURCE CODE: UR/0181/66/008/002/0606/0608

AUTHOR: Zaytsev, V. M.; Mel'nikova, T. N.

ORG: Perm' State University im. A. M. Gor'kiy (Permskiy gosudarstvennyy universitet)

TITLE: Concerning the interaction of a polaron with acoustic oscillations

SOURCE: Fizika tverdogo tela, v. 8, no. 2, 1966, 606-608

TOPIC TAGS: polaron, phonon interaction, temperature dependence, cyclotron resonance, crystal lattice vibration, energy band structure, carrier density

ABSTRACT: In view of the lack of reliable methods for estimating the interaction between a slow electron and acoustical phonons, the authors propose to use for this purpose the temperature dependence of the effective mass of the polaron, which can be determined from experiments on cyclotron resonance. Whereas at zero temperature the addition to the mass is due to the interaction between the electron and the zero-point lattice vibrations, at nonzero temperatures a noticeable contribution is made by the really existing phonons. This leads to a dependence of the energy spectrum and of the effective mass of the polaron on the temperature. The expressions for these dependences are obtained from the Hamiltonian of the

Card 1/2

L 17372-66

ACC NR: AP6004508

the xenon-fluorine compounds are more volatile than the starting $J^{131}F_5$.

Editor's note: J is the Russian periodic symbol for iodine.

SUB CODE: 07/ SUBM DATE: 28Dec64/ ORIG REF: 003/ OTH REF: 003

Card 2/2 nst

L 17372-66 EWT(m)/EWP(t) DIAAP/IJP(c) JD
ACC NR: AP6004508

SOURCE CODE: UR/0186/65/007/005/0629/0630

AUTHOR: Murin, A. N.; Nefedov, V. D.; Kirin, I. S.; Leonov, V. V.; Zaytsev, V. M.; Akulov, G. P.

ORG: none

TITLE: Formation of fluorine-containing compounds of xenon during β -radiation of I^{131} contained in iodine pentafluoride

SOURCE: Radiokhimiya, v. 7, no. 5, 1965, 629-630

TOPIC TAGS: xenon, fluorine, beta radiation, iodine, elemental halogen, fluorine compound, radioisotope

ABSTRACT: Free Xe^{131} was accumulated by bubbling helium for 8 hours at room temperature through a liquid I^{131}F_5 . The origin of this free Xe^{131} is traced to the intermediate formation of a molecular ion $[\text{Xe}^{131}\text{F}_5]^+$. After removal of free Xe^{131} , the β -radiation material was hydrolyzed and the products of hydrolysis were subjected to reduction with various reducing agents. In the course of treatment with HCl the xenon-fluorine compounds were reduced to free xenon. No free xenon was obtained when KI, hydroxylamine, or Fe^{2+} were used as reducing agents. It was found that

Card 1/2

UDC: 546.295'16 : 541.28 : 546.155'161

Measurement of the Velocity of Sound in
Detonation Products

S/020/60/133/01/43/070
B004/B007

L. D. Landau and K. P. Stanyukovich for the explosion products, the isentropic relations for the velocity of sound and the relations at Jouguet point, the time dependence of the density of detonation products and their pressure behind the Chapman-Jouguet plane are calculated. On the basis of these data (Table 2, Figs. 3 and 4) the power of the explosive charge may be calculated. There are 4 figures, 2 tables, and 3 Soviet references.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute
of Chemical Physics of the Academy of Sciences, USSR)

PRESENTED: February 20, 1960 by V. N. Kondrat'yev, Academician

SUBMITTED: February 16, 1960

✓B

B/020/60/133/01/43/070
B004/B007

AUTHORS: Zaytsev, V. M., Pokhil, P. F., Shvedov, K. K.

TITLE: Measurement of the Velocity of Sound²¹ in Detonation Products²¹

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 133, No. 1,
pp. 155 - 157

TEXT: The authors describe a method of measuring the velocity of sound in detonation products of explosives, which consists in the detonation wave being reflected from an inert substance (paraffin). The reflected wave propagates in the detonation products with the velocity of sound, and is recorded by an oscilloscope. Fig. 1 shows the scheme of the experimental setup and an oscillogram. By means of the equation $c = S(D - u)/(Dt - S)$ the average velocity of sound was calculated for a time interval τ (S = distance between the explosive and the inert substance, D = velocity of the detonation front, u = velocity of the detonation products, c = velocity of the reflected wave). The results obtained for trotyl and TG 50/50 (TG 50/50 = 50 % trotyl + 50 % trimethylenetrinitroamine) are shown in Fig. 2 and Table 1. By using the phase equation suggested by

✓B

Card 1/2

81407

Electromagnetic Method of Measuring the Speed of Explosion Products S/020/60/132/06/32/068
B004/B005

The explosives used were trotyl and the melt TR 50/50 (TG 50/50) of equal parts by weight of trotyl and Hexogen. Table 1 indicates the experimental data. The oscillograms obtained show that the mass velocity decreases linearly in the first period. This leads to the conclusion that the exponent of Poisson's adiabatic curve not only depends on the initial density but remains constant for about 3 - 3.5 μsec . There are 2 figures, 1 table, and 6 references: 5 Soviet, and 1 English.

ASSOCIATION: Institut fizicheskoy khimii Akademii nauk SSSR
(Institute of Physical Chemistry of the Academy of Sciences,
USSR)

PRESENTED: February 20, 1960, by V. N. Kondrat'yev, Academician

SUBMITTED: February 20, 1960

Card 2/2

X

81407

S/020/60/132/06/32/068
B004/B005

11.8000

AUTHORS: Zaytsev, V. M., Pokhil, P. F., Shvadov, K. K.

TITLE: Electromagnetic Method²¹ of Measuring the Speed of Explosion Products

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 132, No. 6,
pp. 1339-1340

TEXT: In contrast to the calculation of the exponent of the Poisson adiabatic curve of the explosion products carried out in Refs. 1, 2, the authors applied the direct measurement of the speed of the explosion products; a copper- or aluminum foil, 0.3-0.5 mm thick, was moved through the explosion products in an electromagnetic field, and the emf recorded by means of an OK-17M (OK-17M) cathode-ray oscilloscope. Fig. 1 shows the experimental apparatus in which the magnetic field was generated by means of direct current in two halves of the coil winding distant from each other by the coil radius, according to a suggestion by B. K. Shembel'. Fig. 2 shows an oscillogram from which the speed of the explosion products was calculated by extrapolation for the beginning of the foil movement.

Card 1/2

DREMIN, A. N., ZAYTSEV, V. M., ILYUKHIN, V. S., POKHIL, P. F.

"Detonation Parameters."

Advance List of Soviet Papers for Possible Presentation at the 8th International Combustion Symposium, Cal Tech--29 Aug-2 Sep 60.

ZAYTSEV, V.M.

S/121/61/000/003/006/006
D040/D112

AUTHOR: None given

TITLE: Dissertations

PERIODICAL: Stanki i instrument, no.3, 1961, 41

TEXT: Titles are published of four dissertations for the degree of Candidate of Technical Sciences: 1) V.A. Brik, Moskovskiy ordena Lenina energeticheskii institut (Moscow "Order of Lenin" Power Engineering Institute), "Design development and investigation of a computer arrangement for programming the machining of general machine parts"; 2) T'ang Yung-huang, Moskovskiy stankoinstrumental'nyy institut im. I.V. Stalina (Moscow Institute of Machine Tools and Instruments im. I.V. Stalin), "Automation of nonperiodical motions of automatic machine tools"; 3) Liu Wen-fu, Moscow Institute of Machine Tools and Instruments im. I.V. Stalin, "Investigation of thread formation by thread-cutting and thread-rolling heads"; 4) V.M. Zaytsev, Moskovskiy aviatsionnyy tekhnologicheskii institut (Moscow Aviation Technological Institute), "The efficiency of coolants in turning stainless and

Card 1/2

ZAYTSEV, V.M.

Ferromagnetic and paramagnetic Curie points. Fiz. met. i
metalloved. 11 no. 5:803-805 My '61. (MIRA 14:5)

1. Permskiy gosudarstvennyy universitet.
(Ferromagnetism) (Curie point)

* NOVIKOV, I.I.; ZAYTSEV, V.M.; YASTRZHEMSKIY, A.S., prof., doktor
tekh. nauk, retsenzent; MATVEYEVA, A.V., red.; VLASOVA, N.A.,
tekh. red.

{Thermodynamics in questions and answers} Termodinamika v vop-
rosakh i otvetakh. Moskva, Gos. izd-vo lit-ry i obshch. nauk
noi nauki i tekhniki, 1961. 142 p. (MIRA 15:4)
(Thermodynamics)

Chemical changes during the ...

S/186/62/004/003/016/022
E075/E436

of TeR_2 . This proceeds according to the equation
 $\text{TeR}_3^+ \longrightarrow \text{TeR}_2 + \text{R}^+$. There are 2 figures and 1 table.

SUBMITTED: March 25, 1961

Card 2/2

S/186/62/004/003/016/022
E075/E436

AUTHORS: Nefedov, V.D., Kirin, I.S., Zaytsev, V.M.

TITLE: Chemical changes during the processes of β -decay of Sb^{125} entering into the composition of some phenyl and tolyl derivatives

PERIODICAL: Radiokhimiya, v.4, no.3, 1962, 351-355

TEXT: Chemical changes were studied for the β -decay processes of Sb^{125} in derivatives of type $\text{Sb}^{125}\text{R}_3$ and $\text{Sb}^{125}\text{R}_3\text{Cl}_2$ using paper chromatography. It was shown that the changes can be utilized to obtain new methods for the synthesis of $\text{Te}(\text{C}_6\text{H}_5)_2$, $\text{Te}(\text{C}_6\text{H}_5)_2\text{Cl}_2$, $\text{Te}(\text{C}_6\text{H}_5)_3\text{Cl}$, $\text{Te}(\text{p-CH}_3\text{C}_6\text{H}_4)_2$, $\text{Te}(\text{p-CH}_3\text{C}_6\text{H}_4)_2\text{Cl}_2$ and $\text{Te}(\text{p-CH}_3\text{C}_6\text{H}_4)_3\text{Cl}$. The main product resulting from the decay of $\text{Sb}^{125}\text{R}_3$ was in the form of TeR_3Cl and TeR_2 . TePh_3Cl was produced with $27\% \pm 3\%$ yield and TeTol_3Cl with $29 \pm 3\%$ yield. The compounds are believed to be products of stabilization of primary ion $\text{Te}^{125m}\text{TeR}_3^+$. It is also believed that detachment of the positively charged radical takes place from the excited molecular ion TeR_3^+ , leading to the stabilization of a considerable proportion of Te^{125m} in the form of primary fragmentation product

Card 1/2

NEFEDOV, V.D.; KIRIN, I.S.; ZAYTSEV, V.M.

Chemical changes in the composition of phenyl derivatives of
pentavalent antimony during β -decay of Sb^{125} . Radiokhimiya 6
no. 1:78-85 '64. (MIRA 17:6)

GERSHUNI, G.Z.; ZHUKHOVITSKIY, Ye.M.; LAYTSEV, V.M.

Electronic structure of the methane molecule. *Zh. struk-
chim.* 5 no.4:598-603 Ag '64. (MIRA 1964)

1. Permskiy gosudarstvennyy universitet i Permskiy gosudarstvennyy
pedagogicheskiy institut.

ZAYTSEV, V.M., inzh.

Dependence of the angular velocity of electric motors on the resistance
of the excitation circuit. Elek. sta. 36 no.11:83 N '65. (MIRA 18:10)

MURIN, A.N.; NEFEDOV, V.D.; KIRIN, I.S.; LEONOV, V.V.; ZAYTSEV, V.M.; AKULOV, G.P.

Formation of fluorine-containing xenon compounds during the β -decay
of ^{131}I in iodine pentafluoride. Radiokhimiia 7 no.5:629-630 '65.
(MIRA 18:10)

85081
S/139/60/000/004/034/044/XX
E032/E414

Thermodynamic Properties of Helium Above the λ Point

results as were obtained in Ref.1.

n.b. This is an abridged translation.

ASSOCIATION: Permskiy gosudarstvennyy universitet
(Permsk State University)

SUBMITTED: April 10, 1959

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85081

S/139/60/000/004/034/044/XX
E032/E414Thermodynamic Properties of Helium Above the λ Point

A similar formula can be obtained for the compressibility. By using another characteristic function, e.g. the energy, the enthalpy or the free energy instead of the thermodynamic potential, analogous formulae can be obtained for other thermodynamic quantities. In general, if a quantity M is a second derivative of one of the thermodynamic potentials, then:

$$M = M_0 - \frac{k \Delta C}{8\pi\alpha^{3/2} \sqrt{a(T - T_\lambda)}} \Delta M \quad (9)$$

where ΔM is the discontinuity in M at the Curie point. Thus, above the λ point, all the second derivatives of the thermodynamic potential, the free energy etc. exhibit an anomalous behaviour and increase in accordance with the $(T - T_\lambda)^{-1/2}$ law as the λ point is approached. The above method can also be applied to phase transitions involving symmetry changes. In the case of thermal conductivity the analysis leads to the same

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Thermodynamic Properties of Helium Above the λ Point

where $\delta\Phi/\delta V$ is the variational derivative of the thermodynamic potential. This quantity is given by:

$$\frac{\delta\Phi}{\delta V} = f(\alpha V^2 - AV) \quad (5)$$

where f is, in general, a function of T, V, V^2 and $V^2 V$. It can be shown from these expressions that the specific heat near the Curie point is then given by:

$$C_p = C_{p0} + \frac{k \alpha^2 3/2 V}{16 \pi \alpha^{3/2} \sqrt{T - T_c}} \quad (7)$$

while the coefficient of thermal expansion is given by:

$$\frac{1}{V} \left(\frac{\partial V}{\partial T} \right)_p = \frac{1}{V} \left(\frac{\partial V}{\partial T} \right)_{p,0} + \frac{k \alpha \left(\frac{\partial A}{\partial P} \right)_T \left(\frac{\partial A}{\partial T} \right)_p}{16 \pi \alpha^{3/2} \sqrt{a(T - T_c)}} \quad (8)$$

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S/139/60/000/004/034/044/XX
E032/E414Thermodynamic Properties of Helium Above the λ Point

Analogous relationships hold for superconductors (Ref. 4). The parameter Ψ is closely related to the true wave function of the system in such a way that $\bar{\Psi}^*(\vec{r}')\Psi(\vec{r})$ can be expressed in terms of the single-particle density matrix. It may therefore be considered that the quantity $\bar{\Psi}^*(\vec{r}')\Psi(\vec{r})$ is a measure of the short-range order and the total thermodynamic potential is a functional of $\bar{\Psi}^*(\vec{r}')\Psi(\vec{r})$. The bar over the symbols denotes a time average. The value of $\bar{\Psi}^*(\vec{r}')\Psi(\vec{r})$ may be found as shown in Ref. 1, and the analysis given in that paper shows that above the λ point

$$\Psi_0(R) \equiv \bar{\Psi}^*(\vec{r}')\Psi(\vec{r}) = \frac{kT}{4\pi\alpha R} \exp \left\{ - (A/\alpha)^{1/2} R \right\} \quad (2)$$

Here, $\alpha = h^2/m$ and $R = |\vec{r} - \vec{r}'|$. Since the thermodynamic potential Ψ is a functional of $\Psi(R)$, it follows that the entropy is given by

$$S = - \left(\frac{\partial \Phi}{\partial T} \right)_{p, \Psi} - \int \frac{\delta \Phi}{\delta \Psi} \frac{\partial \Psi}{\partial T} dV \quad (4)$$

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E032/E414

Thermodynamic Properties of Helium Above the λ Point

matrix $\rho(\vec{r}, \vec{r}')$. In the normal state this density matrix tends to zero when $|\vec{r} - \vec{r}'| \rightarrow \infty$. In the superflowing state the density matrix remains finite (Ref.2). At temperatures which are considerably higher than the temperature corresponding to the λ point the density matrix becomes practically zero already at a distance of the order of the interatomic distances. Near the λ point the density matrix is appreciably different from zero at relatively large distances. The thermodynamic potential of helium near the λ point may be written down in the form:

$$\Phi = \Phi_0 + \frac{\Lambda}{2} |\Psi|^2 + \frac{C}{4} |\Psi|^4 + \frac{h^2}{2m} |\nabla \Psi|^2 \quad (1)$$

where $\Psi = \eta e^{i\varphi}$ is a complex "small parameter" and represents the "effective wave function" of the superflowing liquid, h is Planck's constant, m is the mass of a helium atom, and the dependence of η and φ on the density and velocity of the superflowing part of the liquid is given by

$$\rho_s = m \eta^2; \quad \vec{v}_s = \frac{h}{m} \nabla \varphi$$

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S/139/60/000/004/034/044/XX
E032/E414

11.3120

AUTHOR: Zaytsev, V.M.TITLE: Thermodynamic Properties of Helium Above the λ PointPERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Fizika, 1960,
No.4, pp.3-5

TEXT: It is well known that the thermal conductivity, compressibility, thermal expansion, and similar quantities have a discontinuity at the phase transition of the second kind. In an unordered phase these quantities exhibit an anomalous behaviour immediately after the phase transition point, and this is due to the existence in this region of an appreciable short-range order. The effect of short-range order on the thermal conductivity above the phase transition point was discussed by the present author in a previous paper (Ref.1). However, the results obtained in that paper are correct only for phase transitions associated with symmetry changes and cannot be directly applied to the transition of helium from the superflowing to the normal state. Moreover, one can in this case speak of a kind of short-range order above the λ point. In the case of helium this short-range order is associated with the properties of the single-particle density

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82343

S/139/60/000/03/040/045

Absorption of Sound Above the Curie Point
E032/E314

There are 10 references, 7 of which are Soviet and
3 are English.

ASSOCIATION: Permskiy gosudarstvennyy universitet (Permsk
State University)

SUBMITTED: April 10, 1959

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S/139/60/000/03/040/045
E032/E314

Absorption of Sound Above the Curie Point

$\eta = 16.5$ micropoise (Ref 8), the density is $\rho = 0.147$ g/cm³ and the velocity of sound roughly 220 m/sec. It follows that for viscous absorption $\alpha'/\omega^2 = 0.7 \times 10^{-17}$ sec²/cm, which is several times smaller than the total absorption. The absorption associated with thermal conductivity is smaller by an order of magnitude. Using the values of α/ω^2 given by Chase, it is found that the absorption associated with the relaxation of short-range order is given by:

$$\alpha''/\omega^2 = 5 \cdot 10^{-18} / \sqrt{T - T_c} \text{ sec}^2/\text{cm}$$

i.e. it is similar to that given by Eq (4). The relaxation time τ can be estimated from Eq (4) and it is found that $\tau \sim 10^{-10}$ sec. This is only a rough estimate since the quantities involved in Eq (4) are not well known near the λ point.

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Absorption of Sound Above the Curie Point

approached $c_{\infty}^2 - c_0^2 \rightarrow \infty$. In fact, the specific heat above the Curie point (Ref 7) is given by Eq (2). An analogous formula can be obtained for the specific heat at constant pressure. $c_{\infty}^2 - c_0^2$ can be expressed in terms of $C_v - C_{v0}$. This is shown by Eq (3), in which

$(dT/dv)_{\lambda}$ is taken along the line of Curie points. Since $C_v - C_{v0}$ is given by the third equation on

p 231 (Ref 7), where ΔC is the discontinuity in the specific heat and d is roughly equal to the distances between neighbouring atoms. The sound-absorption coefficient is then given by Eq (4). The latter equation can be compared with the experimentally determined sound-absorption coefficient (Chase - Ref 4) in helium. The total absorption coefficient consists of two parts, one of which is associated with viscosity and thermal conductivity and the other with the relaxation of the short-range order. Near the λ point the viscosity

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E032/E314

Absorption of Sound Above the Curie Point

order above the Curie point. If the equilibrium value of the short-range order is σ_0 , then when the sound wave is propagated through the material, σ will approach its equilibrium value. For small deviations from equilibrium the kinetic equation for σ is $d\sigma/dt = -(\sigma - \sigma_0)/\tau$. The relaxation time τ cannot be determined thermodynamically. It can, however, be expected that near the Curie point the short-range order relaxation time remains finite. In that case, the coefficient of absorption of sound in a liquid is given by Eq (1) (Ref 6). In this equation, c_∞ is the velocity of sound in a process which is so fast that σ does not alter, c_0 is the velocity of sound in a process which is so slow that the system remains in equilibrium all the time. It is assumed in the derivation of Eq (1) that $\sigma_\infty - \sigma_0 \ll c_0$. Analogous formulae can be obtained for solids. It can be shown that as the Curie point is

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S/139/60/000/03/040/045
E032/E314

24.1200

AUTHOR: Zaytsev, V.M.

TITLE: Absorption of Sound Above the Curie Point

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Fizika,
1960, No 3, pp 230 - 231 (USSR)

ABSTRACT: It is usually considered that the anomalous absorption of sound associated with the order-disorder transition takes place only in the ordered phase. The exception is the absorption of sound in the piezoelectric phase of ferroelectrics where the propagation of sound leads to the appearance of spontaneous polarisation which, in turn, gives rise to absorption near the Curie point. The anomalous absorption of sound is also observed in helium above the λ point. This absorption is undoubtedly associated with short-range order, which is still preserved above the λ point. Fine (Ref 5) has observed an increase in the internal friction in cobalt oxides on approaching the antiferromagnetic Curie point on the paramagnetic side. Analogous effects may be observed in other substances also. This additional absorption is associated with the relaxation of the degree of short-range

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SOV/126-7-2-19/39

On the Behaviour of a Ferromagnetic in a Magnetic Field Near the Curie Point

an external field the specific heat should pass through a maximum. The dependence of the specific heat on temperature is given by

$$C_p = C_{p_0} + T \frac{a^2 M_0^2}{A + 3CM_0^2} \quad (11)$$

It is easy to show from this expression that C_p as a function of temperature passes through a maximum whose position shifts towards lower temperatures as the magnetic field increases. Assuming that the coefficient C is independent of temperature, the maximum value of the specific heat is given by

$$(C_p - C_{p_0})_{\max} = \frac{a^2 \theta}{2C} \left[1 - \frac{5}{3} \frac{\theta - T}{\theta} \right] \quad (14)$$

All the above conclusions hold near the Curie point and provided expression (2) holds. There are 2 figures and 4 Soviet references.

ASSOCIATION: Permskiy gosudarstvennyy universitet (Perm' State University)

SUBMITTED: June 18, 1957
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SOV/126-7-2-19/39

On the Behaviour of a Ferromagnetic in a Magnetic Field Near the Curie Point

follows that in the case of sound of a sufficiently low frequency ($\omega \tau_{\max} \ll 1$) anomalous absorption will not take place. Bearing in mind the dependence of χ on H it is concluded that the magnetic field lowers the absorption of sound for $\omega \tau < 1$ and increases it for $\omega \tau > 1$. The temperature derivative of M at constant H becomes negatively infinite at the Curie point but in the presence of an external magnetic field it passes through a minimum. Using expression (2) it is easy to show that the minimum value of this derivative is given by

$$\left(\frac{\partial M}{\partial T}\right)_{H_{\min}} = - \frac{a}{3C \sqrt[3]{H/C}} \quad (10)$$

Thus, external fields do not shift the position of the minimum. The dependence of the temperature derivative of M at constant H for different value of H is shown in Fig 2. In the absence of an external field, the specific heat of the ferromagnetic has a discontinuity at the Curie point. In the presence of

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SOV/126-7-2-19/39

On the Behaviour of a Ferromagnetic in a Magnetic Field Near the Curie Point

the fact that in equilibrium (2) holds, we find taking $M - M_0$ as small

$$\frac{d}{dt} (M - M_0) = - \frac{1}{\tau} (M - M_0) \quad (7)$$

where

$$\tau = - \frac{1}{\gamma(A + 3CM_0^2)} = - \frac{\chi}{\gamma} \quad (8)$$

Thus τ passes through a maximum near the Curie point. If one knows χ and consequently τ as function of T and H it is possible to determine the effect of temperature and external field on the absorption of sound near the Curie point. The sound absorption coefficient increases anomalously in the frequency range $\omega\tau \sim 1$ (Ref 4). Since in the presence of a magnetic field τ does not increase to infinity but remains finite, it

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SOV/126-7-2-19/39

On the Behaviour of a Ferromagnetic in a Magnetic Field Near the Curie Point

Fig 1 shows the susceptibility as a function of temperature near the Curie point for different values of $H/2C$. As can be seen from this figure, and also from expressions (4) and (5), the position of the maximum shifts in proportion to $H^{2/3}$. The height of the maximum is inversely proportional to $H^{2/3}$. The dependence of χ on H at constant temperature can be found from expression (3) and is

$$\left(\frac{\partial \chi}{\partial H}\right)_T = -6CM_0\chi^3 < 0,$$

i.e. the susceptibility decreases as the field increases. The behaviour of the relaxation time τ is closely connected with the behaviour of the susceptibility. The kinetic equation for the magnetisation as a function of temperature is of the form

$$\frac{d}{dt} (M - M_0) = \gamma \frac{\partial \Phi}{\partial M} \quad (6)$$

Card 3/6 Substituting into (6) the value of Φ from (1), and using

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On the Behaviour of a Ferromagnetic in a Magnetic Field Near the Curie Point

which corresponds to a minimum of the thermodynamic potential. The magnetic susceptibility is given by

$$\chi = \left(\frac{\partial M}{\partial H} \right)_T = \frac{1}{A + 3CM_0^2} \quad (3)$$

If in the first approximation the coefficient C is taken as independent of temperature, then the maximum value of the susceptibility is reached at temperatures satisfying the conditions

$$A \approx 1.2 \sqrt[3]{CH^2} \quad \text{or} \quad T - \theta \approx \frac{1.2}{a} \sqrt[3]{CH^2} \quad (4)$$

The maximum value of χ is

$$\chi_{\max} \approx \frac{0.4}{\sqrt[3]{CH^2}} \quad (5)$$

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24(3)

AUTHOR: Zaytsev, V. M.

SOV/126-7-2-19/39

TITLE: On the Behaviour of a Ferromagnetic in a Magnetic Field
Near the Curie Point (O povedenii ferromagnetika v
magnitnom pole vblizi tochki Kyuri)

PERIODICAL: Fizika Metallov i Metallovedeniye, 1959, Vol 7, Nr 2,
pp 284-287 (USSR)

ABSTRACT: The behaviour of the magnetic susceptibility, thermal capacity and the slope of the magnetisation curve as a function of temperature near the Curie point is investigated. The thermodynamic potential of a ferromagnetic near the Curie point may be written in terms of powers of the magnetisation M in the form

$$\Phi = \Phi_0 + A/2M^2 + C/4M^4 - MH \quad (1)$$

The coefficient A is zero at the Curie point and near it may be represented by $A=a(T-\theta)$. The coefficient C has a non-zero positive value. The equilibrium value of the magnetisation M_0 is given by

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$$CM_0^3 + AM_0 - H = 0 \quad (2)$$

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Collection of Problems in Applied Thermodynamics

SOV/3598

No theoretical considerations are given. The book is based on the textbook "Engineering Thermodynamics" by S.N. Vukalovich and I.I. Novikov. The authors used some material published earlier by the following authors: A.V. Krasnikov; M.V. Nosov and N.A. Kutyrin; S.N. Vasil'yev; Ts. Tsiteman; V.A. Kirillin and A.Ye. Sheyndlin, and others.

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PHASE I BOOK EXPLOITATION

SOV/3598

Novikov, I.I., and V.M. Zaytsev

Sbornik zadach po tekhnicheskoy termodinamike (Collection of Problems in Applied Thermodynamics) Moscow, Atomizdat, 1959.
247 p. 7,000 copies printed.

Sponsoring Agencies: Moscow. Inzhenerno-fizicheskiy institut, and RSFSR. Ministerstvo vysshego i srednego spetsial'nogo obrazovaniya.

Tech. Ed.: R.A. Negrimovskaya.

PURPOSE: This collection of problems is intended for engineering and physics majors in technical schools of higher education. The book may also be useful to power and mechanical engineering students, correspondence students, and persons studying independently.

COVERAGE: This book contains solutions of problems compiled for the course in applied thermodynamics at the Moscow Engineering and Physics Institute. Difficult problems are solved step by step.

Card 1/4

ZAYTSEV, V. M., Cand of Phys-Math Sci — (diss) "Toward the Theory of Phase Transmission of the Second Type," Perm', 1959, 8 pp (Perm' State Univ im Gor'kiy) (ZL, 5-60, 122)

On the Influence of the Short Range Order on the Specific Heat Near a
Phase Transition Point of the Second Kind

transition of the second kind. A formula is derived for the specific heat when the volume remains constant. Within the range of applicability of the expressions derived in this paper the taking into account of the short range order in the ordered phase causes an insignificant decrease of the specific heat. In the non-ordered phase the taking into account of the short range order causes an additional term in the expression for the specific heat. There are 3 references, 2 of which are Soviet.

ASSOCIATION: Perm'skiy gosudarstvennyy universitet (Perm' State University)

SUBMITTED: December 24, 1957

1. Alloys--Phase studies 2. Alloys--Specific heat 3. Mathematics
--Applications

Card 3/3

80V/56-34-5-36/11

On the Influence of the Short Range Order on the Specific Heat Near a
Phase Transition Point of the Second Kind

binary function $\phi_{\alpha\beta}(\vec{r}_1, \vec{r}_2)$ for a binary alloy with a superstructure. It is necessary to take into account the correlation caused by the averaging of the expression $n_{\alpha}(\vec{r}_1) n_{\beta}(\vec{r}_2)$. Analogous considerations may be applied, also to the other phase transitions of the second kind which correspond to changes of the symmetry of the body. The averaging of the expression $n_{\alpha}(\vec{r}_1) n_{\beta}(\vec{r}_2)$ with respect to time is carried out in two steps. First each factor is averaged separately with respect to a time interval that is long with respect to the vibration period of the atom. The expression calculated in this way is then averaged with respect to a time interval which is long with respect to the relaxation time of the fluctuations of the order. The expression for $\phi_{\alpha\beta}(\vec{r}_1, \vec{r}_2)$ calculated in this way is given explicitly and also the further steps of the calculation are discussed. A formula is also given for the thermodynamic potential of the crystal. It is possible to find the energy and the specific heat of the crystal by means of these binary distribution functions. The author investigates, as an example, the specific heat of a binary alloy of the δ -brass type in the vicinity of the phase

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AUTHOR: Zaytsev, V. M.

307/56-34-5-36/21

TITLE:

On the Influence of the Short Range Order on the Specific Heat Near a Phase Transition Point of the Second Kind
(O vliyani blizhnego porjadka na teploemkost' vblizi točki fazovogo perekhoda vtorogo roda)

PERIODICAL:

Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958, Vol. 34, Nr 5, pp. 1302-1305 (USSR)

ABSTRACT:

The author calculates the specific heat in the vicinity of the phase transition of the second kind, using the binary distribution function. The taking into account of the short range order must lead to a slower increase of the specific heat in the vicinity of the Curie point and to an anomalous behavior of the specific heat above Curie point. In order to find the binary distribution function the author investigates the function $n_a(\vec{r})$ that gives the density of the number of particles of the sort a in the point \vec{r} . Its average value $n_a(\vec{r})$ will be the ordinary distribution function $\rho_a(\vec{r})$ and the average value $n_a(\vec{r}_1) n_a(\vec{r}_2)$ will be the binary distribution function $\rho_{ab}(\vec{r}_1, \vec{r}_2)$. The author first investigates the

Card 1/3

TAVGER, B.A.; ZAYTSEV, V.M.

Magnetic symmetry of crystals. Zhur.eksp.1 teor.fiz. 30 no.3:
564-568 Mr '56. (MLRA 9:8)
(Crystals--Magnetic properties)

ZAYTSEV, V.M.; YASTRZHEMSKIY, A.S., prof., doktor tekhn. nauk,
retsensent; TARAKANOVA, L.A., red.

[Engineering thermodynamics] Tekhnicheskaya termodina-
mika. Moskva, Mosk. inzh.-fizicheskiy in-t, 1963. 208 p.
(MIRA 18:7)

NEFEDOV, V.D.; KIRIN, I.S.; ZAYTSEV, V.M.; SEMENOV, G.A.; DZEVITSKIY, B.E.

Use of multiple tagged compounds in the study of the mechanism of
antimony isotopic exchange in its methyl derivatives. Zhur.ob.khim.
33 no.7:2407-2410 J1 '63. (MIRA 16:8)
(Antimony organic compounds) (Deuterium compounds)
(Antimony isotopes)

NEFEDOV, V. D.; KIRIN, I. S.; ZAYTSEV, V. M.

Chemical changes during β -decay of Sb^{125} , present in certain
phenyl- and tolyl derivatives. Radiokhimiia 4 no.3:351-355
'62. (MIRA 15:10)

(Antimony--Isotopes)
(Organometallic compounds)

ZAYTSEV, V. M., GRACHEV, S. A., MURIN, A. N., NEFEDOV, V. P. (USSR)

"Use of Chemical Changes Accompanying Processes of Beta-Decay of RaE for the Synthesis of Organic Compounds of Polonium".

paper submitted for the Symposium on the Chemical Effects of Nuclear Transformation (IAEA) Prague, 24-27 Oct. 1960.

Synthesis of Elemental-organic Compounds of Polonium by Using Chemical Changes Taking Place During the Processes of Beta Decay of RaE

81723
8/020/60/133/01/34/070
B011/B003

ASSOCIATION: Leningradskiy gosudarstvennyy universitet im. A.A. Zhdanova
(Leningrad State University imeni A. A. Zhdanov)

PRESENTED: March 10, 1960, by A. N. Nesmeyanov, Academician

SUBMITTED: March 8, 1960

4

Synthesis of Elemental-organic Compounds of
Polonium by Using Chemical Changes Taking
Place During the Processes of Beta Decay of RaE

81723
S/020/60/133/01/34/070
B011/B003

CCl_4 (without treatment of the paper): R_f : $\text{TePh}_3\text{Cl} \sim 0$; TePh_2Cl_2 0.6 - 0.7; $\text{TePh}_2 \sim 1$. Fig. 2 shows the distribution of the α -activity among various chemical modifications of polonium on accumulation in Bi(RaE)Ph_3 crystals: PoPh_2Cl_2 15 \pm 6%; PoPh_2 24 \pm 6%, and the sum of the remaining Po derivatives was 61 \pm 6%. Data are also given for CCl_4 and petroleum ether. Fig. 3 shows the results of chromatographing in ethyl acetate ($R_f = 0.54$).

It may be seen that the chemical state has a strong effect on the yields of various RaE forms. This makes it possible to utilize chemical changes occurring in β -decay for the synthesis of the Po compounds mentioned in the title. The authors thank G. A. Razuvaev, Corresponding Member of the AS USSR, and B. K. Preobrazhenskiy for their advice. There are 3 figures and 15 references: 9 Soviet, 1 American, 4 German, and 1 Chinese.

Card 3/4

81723
S/020/60/133/01/34/070
B011/B003

Synthesis of Elemental-organic Compounds of
Polonium by Using Chemical Changes Taking
Place During the Processes of Beta Decay of RaE

derivatives. Polonium was accumulated in crystals of Bi(RaE)Rh_3 and $\text{Bi(RaE)Ph}_3\text{Cl}_2$. In order to obtain these compounds with a sufficiently high specific activity, the authors made use of chemical changes occurring during the β -decay of RaD which is contained in RaDPh_4 . The main problem was the isolation and identification of the compounds of the daughter elements of polonium (RaF), for which purpose the authors used paper chromatography. Analogous derivatives of tellurium, TePh_2 , TePh_2Cl_2 , and TePh_3Cl , labeled with Te^{127} , were used to determine the position of individual elemental-organic polonium compounds on the chromatogram. These Po compounds were separated in the presence of microquantities (μg) of these carriers. Results of measurement are shown in Fig. 1. The following values were obtained for the above-mentioned tellurium compounds in ethyl acetate: R_f : $\text{TePh}_3\text{Cl} \sim 0.1$; TePh_2Cl_2 0.50 - 0.55; TePh_2 0.70 - 0.75. The following values were obtained in

81723

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B011/B003

5.2500
5.3700(B)

AUTHORS:

Murin, A. N., Nefedov, V. D., Zaytsev, V. M., Grachev, S. A.

TITLE:

Synthesis of Elemental-organic Compounds of Polonium¹ by
Using Chemical Changes Taking Place During the Processes
of Beta Decay of RaE₁₉

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 133, No. 1,
pp. 123 - 125

TEXT: The ability of the elements polonium, francium, and astatine to form elemental-organic compounds is a result of their position in the periodic system and of a general law discovered by D. I. Mendeleev. This law was newly formulated by Academician A. N. Nesmeyanov (Refs. 1 and 2). The present paper describes the development of new methods of synthesizing the compounds mentioned in the title, which had been unknown so far. The method based on the utilization of chemical changes occurring during β -decay might be useful in this case (Refs. 7-11 for bismuth). The authors prove that the said polonium compounds (RaF) are formed by β -decay of RaE. RaE is a component of several aromatic

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21788

S/123/61/000/004/008/027
A004/A104

On the physical nature of the cooling effect ...

viscosity of the flowing boundary layer in the chip. The reduction in tool wear if 10% emulsion under pressure and carbonic acid is used, possessing a maximum cooling power, is effected mainly owing to a deterioration of the conditions for the solid alloy material diffusion in the chip, which is taking place in the most intensive way at 800°C. There are 14 figures, 6 tables and 2 references.

E. Dymova

[Abstractor's note: Complete translation]

Card 3/3

21788

S/123/61/000/004/008/027
A004/A104

On the physical nature of the cooling effect ...

requirements are met in the most effective way by 10% oil emulsion which is fed in an atomized state at 10-15 atm pressure. This medium is characterized by the maximum cooling power. The maximum lubricating properties will be found in a medium whose molecules are characterized by a high mobility, by the capacity to form at least on one of the contact surfaces uninterrupted films which are preserved at a pressure of $P = 50-60 \text{ kg/mm}^2$ and $800-900^\circ\text{C}$. One of these fluids is "sulfofrezol" an addition of 2% of which to 5% aqueous oil emulsion imparts the latter high lubricating properties and considerably reduces the friction coefficient between tool and chip. The chemical activity of a medium is determined by the capacity of its molecule to form on the contact surfaces chemical compounds which possess a reduced strength or smoothness. Of the investigated media to the number of chemically active ones belongs oxygen which, forming oxide films on the tool surface and yielding to the oxidation of steel, reduces the friction coefficient and, in some cases, contributes to a decrease of tool wear. An increase in the tool life in the case of cooling does not take place on account of a reduction of the cutting forces or the coefficient of friction; in the contrary, these factors increase during the application of nearly all cooling media (with the exception of emulsion with sulfofrezol), since a decrease in temperature by $100 - 150^\circ\text{C}$ during high-speed cutting at $800 - 1,100^\circ\text{C}$ promotes the increase of

Card 2/3

21788
S/123/61/000/004/008/027
A004/A104

1.1100 only 2908, also 1583

AUTHOR: Zaytsev, V. M.

TITLE: On the physical nature of the cooling effect of heat-resisting materials by liquid and gaseous media

PERIODICAL: Referativnyy zhurnal, Mashinostroyeniye, no. 4, 1961, 17, abstract 4B128. (Tr. Kuybyshevsk. aviats. in-t, 1959, no. 9, 35-50)

TEXT: According to the character of their effects, three groups of lubricating and cooling media are distinguished: media with a cooling effect; chemically active media, forming during their reaction with the material being worked and the material of the cutting tool a compound in the form of a fine film which reduces the intensity of galling and diffusion; surface-active media forming on the contact surfaces finest (in several atomic layers) adsorption films. To which of the mentioned groups a medium belongs is determined by its thermophysical and chemical properties: molecular state, heat conductivity, thermal capacity, viscosity, specific gravity, surface tension magnitude, steaming heat, flash point, etc. Media with a high heat conductivity, thermal capacity, steaming heat, specific gravity and low viscosity possess the maximum cooling power. These

Card 1/3

8(2)

SOV/91-59-6-22/33

AUTHOR: Zaytsev, V.M., Engineer

TITLE: A Portable Device for Checking Protective Current
Circuits for Generators and for Blocks of Generator-
Transformers

PERIODICAL: Energetik, 1959, Nr 6, pp 26-27 (USSR)

ABSTRACT: The author introduces a device, as specified in the
title, whose circuit diagram is shown in Figure 1
and outer appearance in Figure 2. It is stated that
this device was practically tested and worked satis-
factorily. No further information is given. There
are 1 circuit diagram and 1 photo.

Card 1/1

ZAYTSEV, V.M.

Significance of electrophoretic investigations on blood protein fractions in acute myocardial infarct; preliminary communication.
Terap.arkh. 30 no.9:62-66 S'58 (MIRA 11:10)

1. Iz kafedry fakul'tetskoy terapii (zav. - prof. Z.I. Malkin)
Kazanskogo meditsinskogo instituta.
(MYOCARDIAL INFARCT, blood in.
proteins, electrophoresis (Rus))
(BLOOD PROTEINS, in var. dis.
myocardial infarct, electrophoresis (Rus))

ZAYTSEV, V.M. (Kazan')

Electrophoretic examination of blood protein fractions in atherosclerosis. Klin.med. 35 no.5:124-129 My '57. (MLRA 10:8)

1. Iz kafedry fakul'tetskoy terapii (zav. - zasluzhennyy deyatel' nauki Tatarskoy ASSR prof. Z.I.Malkin) Kazanskogo meditsinskogo instituta

(ARTERIOSCLEROSIS, blood in
protein fractions, electrophoresis)

L 13107-66

ACC NR: AP5025789

deficiency of silicon in the sublattice of the silicide as compared to the bisilicide is not due to the crystallization process but to the physicochemical nature of the compound formed. Orig. art. has: 2 figures, 2 tables. 0

SUB CODE: 07/ SUBM DATE: 17Apr65/ ORIG REF: 005/ OTH REF: 004

Card

2/2

L 13107-46 EMT(m)/T/EWP(t)/EWP(b)/INA(o) IJP(e) JD
 ACC NR AP5025789 SOURCE CODE: UR/0363/65/001/009/1526/1529

AUTHOR: Nikitin, Ye. N.; Zaytsev, V. K. 26
 B

ORG: Institute of Semiconductors, Academy of Sciences SSSR (Institut poluprovodnikov Akademii nauk SSSR)

TITLE: Preparation of a higher manganese silicide by a gas transport reaction 27 27

SOURCE: AN SSSR. Investiya. Neorganicheskiye materialy, v. 1, no. 9. 1965, 1526-1529

TOPIC TAGS: manganese compound, silicide, thermal emf

ABSTRACT: $MnSi_{1.77}$ was synthesized by a gas transport reaction, i. e., was obtained in the solid state from the gaseous phase. The melting process and the defects associated with crystallization and peritectic reaction were thus eliminated. $MnCl_2$ --the transporting agent--was reacted with pure silicon in sealed ampoules at 10^{-5} mm Hg and $700^{\circ}C$. X ray diffraction of $MnSi_{1.77}$ showed a well formed crystal structure without silicon phase impurity. Thermal emf measurements showed that the silicide obtained by the gas transport reaction has the same degree of purity as a single crystal obtained by oriented crystallization. The

Card 1/2 UDC: 546.71'281

ZAYTSEV, V.K.

Information on problems in making standardized estimates.
(MIRA 13:1)
Transp.stroi. 9 no.8:58 Ag '59.

1. Nachal'nik otдела preyskurantov i smotnykh norm Giproprom-
transstroya.
(Building--Estimates)

L 3665-66
ACCESSION NR: AP5021364

ENCLOSURE: 01

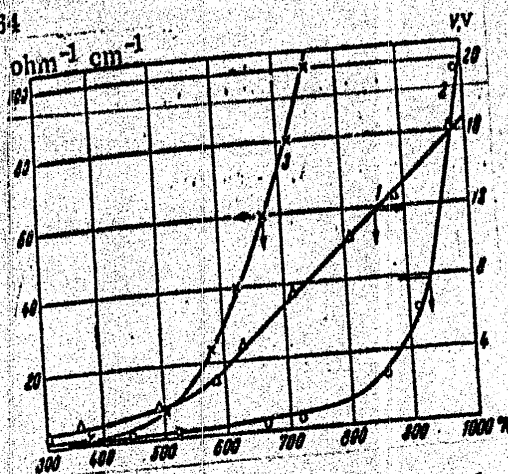


Fig. 1. Temperature dependence of the electrical conductivity: 1 - Silicon, contactless method, in voltmeter scale units; 2 - for the same sample of silicon, using the probe method, in ohm⁻¹ cm⁻¹; 3 - germanium, contactless method, in ohm⁻¹ cm⁻¹.

Card 3/3

L 3605-66

ACCESSION NR: AP5021364

ASSOCIATION: Institut poluprovodnikov AN SSSR, Leningrad (Institute of Semiconductors,
AN SSSR) 55,44

SUBMITTED: 22 June 64

NO REF SOV: 004

ENCL: 01

OTHER: 004

SUB CODE: SS, EM

Card 2/3

L 3605-66 EWT(1)/T/EWA(h) LJP(c) AT

ACCESSION NR: AP5021364

UR/0120/65/000/004/0203/0205

621.317.33:621.315.592.2

AUTHOR: Nikitin, Ye. N.; Zaytsev, V. K.

TITLE: A device for the determination of electrical conductivity of semiconducting materials in liquid and solid phase

SOURCE: Pribery i tekhnika eksperimenta, no. 4, 1965, 203-205

TOPIC TAGS: semiconductor conductivity, semiconducting material, silicon semiconductor, germanium conductor

ABSTRACT: This paper describes a device for the high-temperature synthesis as well as for the contactless measurement of the electrical conductivity of semiconductor materials. During the process of synthesis the instrument can check the electrical conductivity of solid and liquid semiconductor substances within the crucible and can follow the temperature dependence of the conductivity with an accuracy of some 10 - 20%. Curves in Fig. 1 of the Enclosure illustrate the operation of the device. Orig. art. has: 3 figures and 1 table.

Card 1/3

ZAYTSEV, V.K.

DMOKHOVSKIY, V.K., professor, zasluzhennyi deyatel' nauki i tekhniki;
ZAYTSEV, V.K., inzhener; SAKHAROVA, M.P., inzhener

Methods of planning measures for stabilizing earthen road beds.
Tekh.zhel.dor.6 no.12:19-20 D'47. (MIRA 8:12)
(Railroads--Earthwork) (Soil stabilization)

ZAYTSEV, V.K.

Instruction on making standardized estimates. Transp.stroi. 9
no.6:58-59 Je '59. (MIRA 12:11)

1. Nachal'nik otдела preyskurantov i smetnykh norm Gipropromtrans-
stroya.

(Building---Estimates)

ZAYTSEV, V.K., glav. red.; RYMAREV, G.S., red.; YERMOLOV, S.S.,
otv. red.; KHITROV, P.A., tekhn. red.

[Production norms for design, planning and surveying work
paid according to piece rate wage system] Normy vyrabotki
na proektnye i izyskatel'nye raboty, oplachivaemye sdel'no.
Moskva, Transzheldoriadat. Pt.18. [Railroads, bridges, tun-
nels. Sec.3. Tunnels] Zheleznnye dorogi, mosty, tonneli.
Sec.3. Tonneli. 1954. 74 p. Pt.19 [Automobile roads; city
transportation] Avtomobil'nye dorogi, gorodskoi transport.
(MIRA 16:10)
1954. 31 p.

1. Russia (1923- U.S.S.R.) Ministerstvo putey soobshcheniya.
(Road construction) (Local transit)
(Tunnels--Design and construction)

ACC NR: AP6021780

(A)

SOURCE CODE: UR/0413/66/000/012/0045/0045

INVENTORS: Vitkov, G. D.; Kamentsev, V. V.; Seleznev, P. H.; Zaytsev, V. K.;
Morozov, P. P.; Yakovlev, V. A.; Tatishchev, P. A.

ORG: none

TITLE: An induction furnace for heating blanks. Class 18, No. 182756

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 12, 1966, 45

TOPIC TAGS: furnace, induction furnace, refractory alloy

ABSTRACT: This Author Certificate presents an induction furnace for heating blanks of complex shapes, made of refractory alloys, in a nonoxidizing atmosphere. To save the refractory alloys and to produce proper heating, the furnace is provided with a hermetically closed casing which contains two induction heating elements. The two heating chambers formed are interconnected by transmitting tunnels. A closed rectangle conducts push rods for a self-dumping pan with blanks being heated.

SUB CODE: 13/ SUBM DATE: 11Mar63

Card 1/1

UDC: 621.365.5:621.785.1

ZAYTSEV, V.K., inzh., red.; MUNITS, A.P., red.izd-va; EL'KINA, N.M.,
~~red.~~

[Production norms for planning and survey work paid for according to a piece-rate system] Normy vyrabotki na proektnye i izyskatel'skie raboty, oplachivaemye sdel'no. Pt.22. [Railroads, bridges, tunnels] Zheleznye dorogi, mosty, tonneli. Moskva. Gos.izd-vo lit-ry po stroit., arkhitekt. i stroit.materialam. 1958. 159 p. (MIRA 12:3)

1. Russia (1923- U.S.S.R.) Gosudarstvennyy komitet po delam stroitel'stva.
(Russia--Industries) (Production standards)